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Indian Standard

SPECIFICATION FOR COBALT POWDER FOR HARDMETALS

(*First Revision*)

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NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR COBALT POWDER FOR HARDMETALS

(First Revision)

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Indian Standard

SPECIFICATION FOR COBALT POWDER FOR HARDMETALS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 29 November 1985, after the draft finalized by the Powder Metallurgical Materials and Products Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Cobalt powder is used in the manufacture of hardmetals, which find applications in cutting tool tips, rock drilling bits, wear parts, and dies.

0.3 This standard was first published in 1974. While reviewing the standard in the light of the experience gained during the years, the sectional committee decided to revise the standard. In this revision, the requirements for chemical composition and average particle size have been modified.

0.4 This standard contains clauses **4.1.1** and **6.1** which call for agreement between the purchaser and the manufacturer.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements of cobalt powder used in the manufacture of hardmetals.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of material shall be as laid down in IS : 1387-1967†.

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*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

3. PROCESS OF MANUFACTURE

3.1 The cobalt powder shall be manufactured by hydrogen reduction process.

4. CHEMICAL COMPOSITION

4.1 The chemical composition of the powder shall be as given below:

Element	*Percent*
Co	98·7, *Min*
Ni	0·5, *Max*
Si	0·02, *Max*
Fe	0·05, *Max*
Al	0·01, *Max*
Cu	0·02, *Max*
Mn	0·02, *Max*
Zn	0·03, *Max*
Mg	0·02, *Max*
Na	0·03, *Max*
Ca	0·03, *Max*
S	0·02, *Max*
Hydrogen loss	0·60, *Max*

4.1.1 The methods of chemical analysis shall be as agreed to between the purchaser and the manufacturer.

4.1.2 The hydrogen loss shall be determined by the method given in IS : 5644-1985*.

5. AVERAGE PARTICLE SIZE

5.1 The average particle size shall be determined in accordance with IS : 7512-1974† and shall be within 1 to 3 µm.

6. SAMPLING

6.1 The sampling of powders for conducting all the tests shall be done in accordance with IS : 6492-1972‡.

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*Method for the determination of hydrogen loss of metallic powders (*second revision*).

†Method for the determination of average particle size of metal powders by Fisher subsieve sizer.

‡Sampling of powders for powder metallurgical purposes.

7. PACKING

7.1 The powder shall be supplied packed in suitable containers in quantities mutually agreed between the purchaser and the manufacturer.

8. MARKING

8.1 Each container of cobalt powder shall be suitably marked with the following informations:

a) Hydrogen reduced cobalt powder,

b) Manufacturer's name,

c) Batch number and the date of manufacture of powder, and

d) Net mass of the powder.

8.1.1 The powder may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 $kg.m/s^2$
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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